

# PATENT ABSTRACTS OF JAPAN

(11)Publication number : **10-049001**  
 (43)Date of publication of application : **20.02.1998**

(51)Int.CI.                   **G03G 21/00**  
                                 **G03G 21/00**  
                                 **G06F 3/14**  
                                 **H04N 1/00**

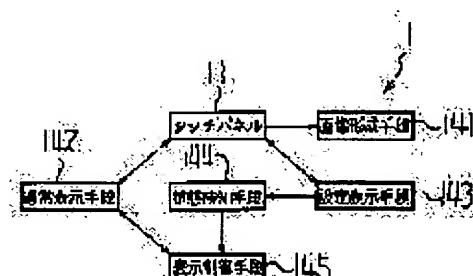
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 (22)Date of filing : **01.08.1996**                       (72)Inventor : **HASHIMOTO YASUNARI**

**(54) IMAGE FORMING DEVICE**

**(57)Abstract:**

PROBLEM TO BE SOLVED: To quickly execute a practical image forming operation.

SOLUTION: In standing by for forming an image, a standard picture capable of operating the multifunction of an image forming means 141 and a simple picture capable of operating a part of the functions of the image forming means 141 are freely switchably displayed on a touch panel 11. While these pictures are displayed, a set picture through which the mode setting of various kinds of functions of the image forming means 141 can be attained is transiently displayed on the touch panel 11. When the display of the set picture is completed, normally the picture before the set picture is displayed is displayed. But when an operation mode associated with only the standard picture is set during the display of the set picture, the display of the set picture is completed and after that, the standard picture is automatically displayed. Therefore, when a practical operation mode is set on the set picture, a practical operation can be executed through the standard picture, after the setting.



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[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]

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[Patent number]

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## DETAILED DESCRIPTION

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### [Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the image formation equipment used for a various functions copying machine etc.

[0002]

[Description of the Prior Art] Multi-functionalization is progressing and image formation equipments, such as a current copying machine, have realized various applied actuation to image formation. Thus, since it is necessary to set up various information in order to realize various applied actuation, it is necessary to prepare many keys in a control panel. Since the appearance of a control panel becomes complicated and needs many components, this has a touch panel in use current. By switching the display screen, it can carry out alter operation of the various information, structure of a touch panel is simple and its occupancy area is also small.

[0003] The image formation equipment using such a touch panel is indicated by JP,6-130766,A and JP,6-35605,A. The image formation equipment indicated by JP,6-130766,A displays only the function to correspond if the function is alternatively set up corresponding to a user's need level and a user is recognized on a touch panel. The image formation equipment indicated by JP,6-35605,A uses the default screen of a touch panel as the display screen of automatic setting, and also displays the control unit which shifts to the actuation screen of a manual setup here.

[0004] Moreover, as actual image formation equipment, the standard screen and the easy screen are prepared as the display screen of a touch panel, and there is a product which switches these alternatively. In this case, the standard screen is created so that application actuation of image formation equipment can be operated, but the easy screen is simplified so that only basic actuation of image formation equipment may be operated.

[0005] With such image formation equipment, the various information on basic actuation can usually be simply set up by carrying out alter operation of this to a touch panel, since a default indication of the easy screen is given. What is necessary is to display a standard screen on a touch panel by actuation of a switch etc., and just to carry out alter operation of this, when performing application actuation. Since these screens are always displayed at the time of standby of image formation, a user should just do alter operation by request just before activation of image formation.

[0006] In addition, although a standard screen and an easy screen are used for temporary mode setting at the time of activation of image formation, with common image formation equipment, the setting screen corresponding to the constant mode setting of image formation is also prepared. that is, adjustment of printing concentration etc. is temporary by the standard screen or the easy screen just before activation of image formation -- mode setting is carried out and it is not usually reflected in next image formation. However, mode setting of the existence of an auto clearance etc. is constantly carried out by the setting screen, and this is continuously maintained until manual operation cancels.

[0007] Where it could make the touch panel display such a setting screen temporarily while displaying an easy screen and a standard screen and this setting screen is displayed, constant mode setting, such as time amount of an auto clearance and existence of an audible tone to various actuation, is performed. Since this setting screen is temporarily displayed while displaying an easy screen and a standard screen, if that display is made to complete, it will return to the display condition of an easy screen or a standard screen currently displayed before the display of a setting screen.

[0008]

[Problem(s) to be Solved by the Invention] At the time of standby of image formation, a standard screen or an easy screen is always displayed on a touch panel, and the above image formation equipments can also display a setting screen temporarily, while displaying these standard screens and easy screens.

[0009] However, since it will return to an easy screen if the display of a setting screen is completed even if the contents of a setting in a setting screen support only the standard screen with such image formation equipment, if it shifts to a setting screen from an easy screen, operability is not good. That is, when a user does alter operation of the mode setting relevant to the correspondence function of a standard screen to a setting screen without relation to the correspondence function of an easy screen, the user has high possibility of wanting to carry out alter operation of the standard screen after termination of a setting screen, and to perform image formation. However, when it shifts to a setting screen from an easy screen, even if it carries out alter operation of the information corresponding to a standard screen on this setting screen, an easy screen will be displayed at the time of termination of a setting screen, and it is necessary to switch this easy screen to a standard screen by manual operation with conventional image formation equipment, since it only returns to the screen before that display simply at the time of

termination of a setting screen, for example.

[0010]

[Means for Solving the Problem] An image formation means to form an image in a print sheet according to the various information to which the image formation equipment of this invention was set, The touch panel which displays various screens and receives the alter operation of various information, A usual display means to display the standard screen corresponding to actuation of the various functions of said image formation means, and the easy screen corresponding to actuation of a part of functions free [ a change-over on said touch panel ] at the time of standby of image formation, A setting display means to make said touch panel display temporarily the setting screen corresponding to the mode setting of the various functions of said image formation means while displaying a standard screen or an easy screen, A condition detection means to detect that the contents of a setting by which alter operation was carried out to the setting screen relate to the correspondence function of a standard screen without relation to the correspondence function of an easy screen, Detection of that the contents of a setting instrument setup relate to a standard screen without relation to an easy screen has a display-control means to display a standard screen on said touch panel compulsorily regardless of the screen before displaying after completion of a temporary display of a setting screen. Therefore, display a standard screen and the applied mode of operation of image formation is set up, since a standard screen or an easy screen is usually displayed on a touch panel free [ a change-over ] by the display means, an easy screen can be displayed at the time of standby of image formation, and the fundamental mode of operation of image formation can be set to it. Thus, after an image formation means will form an image in a print sheet corresponding to this if a mode of operation is set up, and this image formation is completed, temporary mode setting by the standard screen or the easy screen is canceled. On the other hand, the display condition of a standard screen or an easy screen can also be made to be able to display a setting screen on a touch panel temporarily with a setting display means, and the constant mode of operation of an image formation means can be set as it with a setting screen in this case. Since a setting screen is a screen displayed temporarily, at the time of termination of the display, it returns to the screen before a display. However, when it shifts to a setting screen from an easy screen, corresponding to the contents of a setting in a setting screen, it may return to a standard screen. That is, if it is detected by the condition detection means that the contents of a setting by which alter operation was carried out to the setting screen relate to the correspondence function of a standard screen without relation to the correspondence function of an easy screen, regardless of the screen before displaying after completion of a temporary display of a setting screen, a standard screen will be compulsorily displayed on a touch panel by the display-control means.

[0011]

[Embodiment of the Invention] One gestalt of operation of this invention is explained below based on a drawing. First, as the digital copier 1 which is image formation equipment of the gestalt of this operation is shown in drawing 2, it is prepared as some copying machine systems 2, and is equipped with the feed units 3 and 4, the ADF (Automatic Document Feeder) unit 5, and the after-treatment unit 6 of another object.

[0012] The scanner section and the printer section are prepared in the interior of a digital copier 1, said scanner section carries out the reading scan of the image of a reading manuscript, and said printer section forms in a print sheet the image by which a reading scan is carried out. Said ADF unit 5 feeds the scanner section of a digital copier 1 with a reading manuscript, and said feed units 3 and 4 feed the printer section of a digital copier 1 with a print sheet. Said after-treatment unit 6 builds in a sorter, a stapler, and punch, and performs various kinds of after treatment to the print sheet with which the image was formed.

[0013] The control panel 7 is formed before [ top-face ] the digital copier 1, and as shown in drawing 3, as for this control panel 7, it has the touch panel 11 and the keyboard 12. In a detail, more on the keyboard 12 of this control panel 7 As various fundamental keys relevant to copy actuation The ten key 13 with which alter operation of the numeric value is carried out, The clearance / preheat key 14 to which alter operation of mode initialization or the preheating initiation is carried out, the interrupt key 15 to which alter operation of the initiation of an interrupt operation is carried out, the image quality adjustment key 16 to which alter operation of the image quality adjustment is carried out, the program key 17 to which alter operation of mode registration or the initiation of a mode call is carried out, The start key 18 to which alter operation of the copy initiation is carried out, the clearance/stop key 19 with which alter operation of data initialization or the termination of operation is carried out, the screen exchange key 20 to which alter operation of the screen change-over of said touch panel 11 is carried out, and the modulated light key which adjusts brightness of said touch panel 11 21 grade are prepared.

[0014] Here, the electric block structure of the digital copier 1 of the gestalt of this operation is explained below based on drawing 4. First, the Maine control section 31 has CPU (Central Processing Unit)32, ROM (Read Only Memory)33, RAM (Random Access Memory)34, NVRAM (NO Volatilization RAM)35, serial I/F (Interface) 36, a timer circuit 37, etc., and said units 3-6, said control panel 7, the double-sided unit 38, the various alternating current loads 39, the various direct-current loads 40, the various sensors 41, etc. are connected to such a Maine control section 31 of structure.

[0015] Furthermore, the electric block structure of said control panel 7 is explained below based on drawing 5. First, said touch panel 11 has structure which carried out the laminating of back lights (not shown), such as EL (Electro Luminescence), the LCD (Liquid Crystal Display) module 51 of a dot matrix, and the switch plate 52 of an analog one by one. The LCD controller 53 is connected to such a LCD module 51 and the switch plate 52 with said keyboard 12, and ROM54 and RAM55 are directly linked with this LCD controller 53. In addition, since LED (Light Emitting Diode) is built in a part of keys 13-21 of this keyboard 12, the LED driver 56 is connected to said keyboard 12.

[0016] And the address latch 57 is connected to said LCD controller 53, and this address latch 57 and said LCD controller 53 are connected to CPU58. The optical transceiver 59 is connected to this CPU58, and this optical transceiver 59 carries out serial communication of the various data to an external device (not shown) with a beam of light. Furthermore, the address decoder 60

is connected to said address latch 57, and this address decoder 60 is connected to said CPU58 through the system reset 62 while it is directly linked with said LCD controller 53, said LED driver 56, and ROM61.

[0017] The digital copier 1 of the gestalt of this operation performs various actuation according to the various information by which alter operation was carried out with said control panel 7, and copies the image of a reading manuscript to a print sheet. In order to realize the display output and alter operation of various information relevant to such copy actuation, as shown in drawing 6, at the time of standby of an image copy, a standard screen 71 or the easy screen 72 is displayed on said touch panel 11. The image data of these screens 71 and 72 is stored in said ROM54, and is displayed on said touch panel 11 by turns by said LCD controller 53 corresponding to the manual operation of said screen exchange key 20. Although the standard screen 71 supports all functions of a digital copier 1 of copy actuation, the easy screen 72 supports only the function of some fundamental digital copiers 1. These screens 71 and 72 are not used for temporary mode setting of copy actuation, and are not used for the constant mode setting of a digital copier 1.

[0018] More, in a detail, as shown in drawing 6 (a), at a standard screen 71 Various messages The message area 73 and the number of copies to display The number-of-sheets display area 74 to display, The concentration adjustment key 75 for the manual operation of copy concentration, the automatic concentration key 76 for the mode setting of regulating [ of copy concentration ] automatically, the photograph key 77 for the mode setting of a photocopy, the form selection key 78 for manual selection of a print sheet, the form selection key 79 for the mode setting of automatic selection of a print sheet, The form assignment variable power key 80 for the mode setting of form assignment variable power, the scale-factor display area 81 which displays a copy scale factor, the special manuscript delivery key 82 for the mode setting of special manuscript delivery, the after-treatment keys 83-86 for the mode setting of various kinds of after treatment, the various keys 87-90 for the mode setting of various kinds of application actuation, \*\* is displayed.

[0019] Although it is fundamentally displayed as said standard screen 71 similarly as the easy screen 72 is shown in drawing 6 (b), the various keys 75, 77, 80, 82, 85, 87, and 88 of application actuation are not displayed. Where the easy screen 72 is displayed on said touch panel 11, alter operation of the various information on basic actuation, such as a rate of variable power and the number of copies, can be carried out, and where a standard screen 71 is displayed, alter operation of the various information on application actuation, such as a photocopy and form assignment variable power, can be carried out.

[0020] In addition, UP (User Program) mode screen 101 relevant to copy actuation in the standard screen 71 and the easy screen 72 which were mentioned above which is a setting screen for constant mode setting as it is separately indicated in drawing 7 as these screens 71 and 72, although prepared for a temporary data setup is also prepared. This UP mode screen 101 is temporarily displayed from the condition that the standard screen 71 and the easy screen 72 were displayed on said touch panel 11, and is displayed to carry out consecutive operation of a clearance / the stop key 19 to fixed time amount during actuation of a clearance / preheat key 14 of said keyboard 12.

[0021] Since UP mode screen 101 illustrated here is greatly formed in the vertical direction from the viewing area of said touch panel 11, the scrolling key 102,103 which directs the scrolling is displayed on the side. Moreover, in order to end that display in this UP mode screen 101 and to return to the display condition of a standard screen 71 or the easy screen 72, the end key 117 which specifies activity termination is displayed on the upper right. Various modes can be constantly set as a digital copier 1 as a user program, and in order to realize this, various kinds of setting keys 104-116 are expressed as this UP mode screen 101.

[0022] For example, if alter operation of the special tray setting key 105 whose number is one is carried out, as shown in drawing 8, the tray setting screen 121 will be displayed on said touch panel 11 as one low order screen of UP mode screen 101. It is the screen which carries out mode setting of containing a print sheet as a special form to the medium tray (not shown) of said feed units 3 and 4 constantly at said Maine control section 31, and is formed in this tray setting screen 121 here at 2 pages.

[0023] Before returning a key 123 and the tray setting screen 121 to the first page from the second page as various keys 122-124 for menu manipulation to the degree which makes the table-of-contents key 122 for a return on UP mode screen 101, and the tray setting screen 121 shift to the second page from the first page, key 124\*\* is displayed by the tray setting screen 121. moreover, as various keys 125-131 for mode setting The print sheet for covers The medium tray to contain The means of displaying of the tray key 125 only for covers to specify, and the tray for covers As the cover tray display selection key 126 to set up, the tray key 127 only for interleaving paper which specifies the medium tray which contains the print sheet for interleaving paper, the interleaving paper tray display selection key 128 which sets up the means of displaying of the tray for interleaving paper, and a print sheet As the tray key 129 only for recycled paper which specifies the medium tray which contains recycled paper, and a print sheet The tray key 130 only for recycled paper which specifies the medium tray which contains a mother print (tracing paper), the tray key 131 only for special papers which specifies the medium tray which contains special forms other than the above as a print sheet are displayed.

[0024] The proper program is stored in said ROM33 grade, and the digital copier 1 of the gestalt of this operation has realized various functions as various means, when said CPU32 performs data processing corresponding to this. That is, the digital copier 1 of the gestalt of this operation has the image formation means 141, the usual display means 142, the setting display means 143, the condition detection means 144, the display-control means 145, etc. as a logical configuration, as typically shown in drawing 1

[0025] Said image formation means 141 forms an image in the print sheet with which it is fed from said feed units 3 and 4 by said printer section, when said Maine control section 31 carries out motion control of said scanner section, said printer section, etc. according to the various information set up by the manual operation of said touch panel 11 etc.

[0026] Said touch panel 11 is made to usually display the display means 142 for a standard screen 71 and the easy screen 72 at the time of standby of image formation, enabling a free change-over, when said LCD controller 53 carries out the display output

of said image data stored in said ROM54 to said touch panel 11 corresponding to the manual operation of said screen exchange key 20 etc.

[0027] Said setting display means 143 displays UP mode screen 101 on said touch panel 11 temporarily from the display condition of a standard screen 71 or the easy screen 72, when said LCD controller 53 carries out the display output of the image data stored in said ROM54 to said touch panel 11 corresponding to the manual operation of said clearance / stop key 19 etc.

[0028] Said condition detection means 144 detects that the contents of a setting by which alter operation was carried out to UP mode screen 101 relate to the correspondence function of a standard screen 71 without relation to the correspondence function of the easy screen 72, when said Maine control section 31 distinguishes the contents of a setting by which alter operation was carried out to UP mode screen 101 based on predetermined conditions.

[0029] More, among the setting keys 104-116 of UP mode screen 101, in some contents of a setting, in relation to both two screens 71 and 72, other contents of a setting relate only to the standard screen 71, and the identifier is beforehand set to the detail by the thing only relevant to this standard screen 71. For example, since the contents of a setting support both two screens 71 and 72, an identifier is not set up, but since the contents of a setting support only the standard screen 71, as for said auto clear setting key 104, the identifier is set up, as for said special tray setting key 105. Then, said Maine control section 31 will detect that the contents of a setting relate to the correspondence function of a standard screen 71 without relation to the correspondence function of the easy screen 72, if the identifier is set as the setting keys 104-116 by which alter operation was carried out on UP mode screen 101.

[0030] Said display-control means 145 displays a standard screen 71 on said touch panel 11 compulsorily regardless of the screen before displaying after completion of a temporary display of UP mode screen 101, when it is detected that the contents of a setting of UP mode screen 101 relate to a standard screen 71 without relation to the easy screen 72 as mentioned above, and said Maine control section 31 carries out motion control of said LCD controller 53 corresponding to the existence of detection of an identifier.

[0031] In such a configuration, the digital copier 1 of the gestalt of this operation performs image formation as an image copy of a reading manuscript. Thus, when copying the image of a reading manuscript, the reading scan of the reading image is carried out by the scanner section, image data is generated, and this image data is formed in a print sheet of the printer section.

[0032] Display a standard screen 71 and the applied mode of operation of an image copy is set up, since a standard screen 71 or the easy screen 72 is displayed on a touch panel 11 free [ a change-over ] as shown in drawing 9, the easy screen 72 can be displayed at the time of standby of such an image copy, and the fundamental mode of operation of an image copy can be set to it. Thus, after copy actuation will be performed corresponding to this if a mode of operation is set up, and this image copy is completed, temporary mode setting by the standard screen 71 or the easy screen 72 is canceled.

[0033] That is, the mode setting of the image copy by these screens 71 and 72 is temporary, and UP mode screen 101 is used for constant mode setting. In the condition that the standard screen 71 and the easy screen 72 were displayed on the touch panel 11 as mentioned above, if consecutive operation of a clearance / preheat key 14, and the clearance/stop key 19 is carried out to coincidence to fixed time amount, UP mode screen 101 will be temporarily displayed on a touch panel 11. If alter operation of the various information is carried out by the manual operation of this UP mode screen 101, the various modes relevant to an image copy can be set up constantly.

[0034] Since this UP mode screen 101 is displayed on a touch panel 11 temporarily [ while displaying Screens 71 and 72 ] as mentioned above, after ending that display, a touch panel 11 returns to the display condition of Screens 71 and 72. However, in the digital copier 1 of the gestalt of this operation, when it shifts to UP mode screen 101 from the easy screen 72, corresponding to the contents of a setting in UP mode screen 101, it may return to a standard screen 71.

[0035] That is, when the contents of a setting by which alter operation was carried out to UP mode screen 101 relate to the correspondence function of a standard screen 71 without relation to the correspondence function of the easy screen 72, regardless of the screen before a display, a standard screen 71 is compulsorily displayed on a touch panel 11 after completion of a temporary display of UP mode screen 101. For this reason, after ending the display of this UP mode screen 101 when UP mode screen 101 is displayed on a touch panel 11 and mode setting of the applied copy actuation is carried out in order that a user may perform applied copy actuation, even when the easy screen 72 is displayed on the touch panel 11 before that display, a standard screen 71 is automatically displayed on this touch panel 11. Therefore, a user can perform various actuation of applied copy actuation by the standard screen 71, and can perform quickly applied copy actuation for which it asks.

[0036]

[Effect of the Invention] A usual display means by which the image formation equipment of this invention displays the standard screen corresponding to actuation of the various functions of an image formation means, and the easy screen corresponding to actuation of a part of functions free [ a change-over on a touch panel ] at the time of standby of image formation, A setting display means to make a touch panel display temporarily the setting screen corresponding to the mode setting of the various functions of an image formation means while displaying a standard screen or an easy screen, A condition detection means to detect that the contents of a setting by which alter operation was carried out to the setting screen relate to the correspondence function of a standard screen without relation to the correspondence function of an easy screen, A display-control means to display a standard screen on a touch panel compulsorily regardless of the screen before displaying after completion of a temporary display of a setting screen if it is detected that the contents of a setting instrument setup relate to a standard screen without relation to an easy screen, Since a standard screen will be automatically displayed regardless of the screen before a display after ending the display of a setting screen if the mode of operation only relevant to a standard screen is set up in the display condition of a setting screen by \*\*\*\*(ing) Even if a user does not switch an easy screen to a standard screen by manual

operation, applied image formation actuation can be performed quickly.

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## DESCRIPTION OF DRAWINGS

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[Brief Description of the Drawings]

[Drawing 1] It is the mimetic diagram showing the logical configuration of the digital copier which is one gestalt of operation of the image formation equipment of this invention.

[Drawing 2] It is the perspective view showing the appearance of a digital copier.

[Drawing 3] It is the top view showing a control panel.

[Drawing 4] It is the block diagram showing the physical structure of the whole digital copier.

[Drawing 5] It is the block diagram showing the important section of a digital copier.

[Drawing 6] The top view where (a) shows the condition of having displayed the standard screen to a touch panel, and (b) are the top views showing the condition of having displayed the easy screen.

[Drawing 7] It is the top view showing the condition of having displayed UP mode screen as a setting screen on a touch panel.

[Drawing 8] It is the top view showing the condition of having displayed the special tray setting screen which is a low order screen of UP mode screen on a touch panel.

[Drawing 9] It is the flow chart which shows processing actuation of the screen display of a touch panel.

[Description of Notations]

1 Image Formation Equipment

11 Touch Panel

71 Standard Screen

72 Easy Screen

101 Setting Screen

141 Image Formation Means

142 Usually, Display Means

143 Setting Display Means

144 Condition Detection Means

145 Display-Control Means

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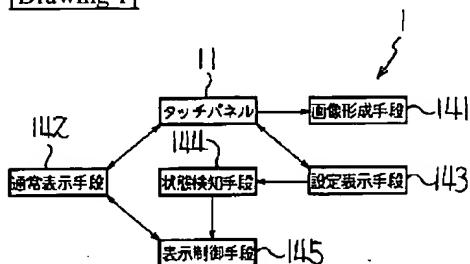
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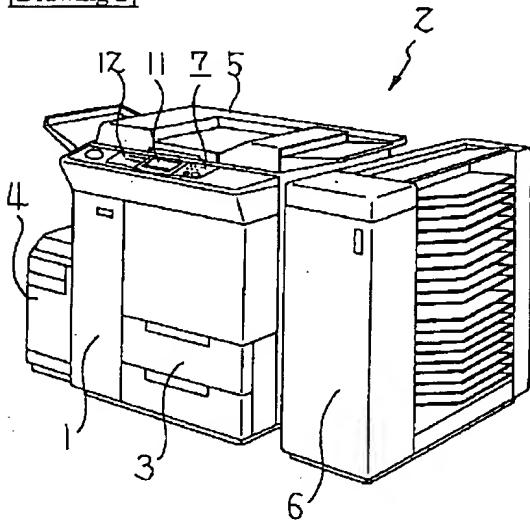
DRAWINGS

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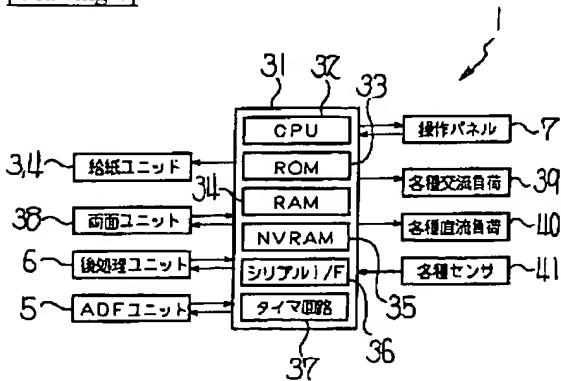
[Drawing 1]



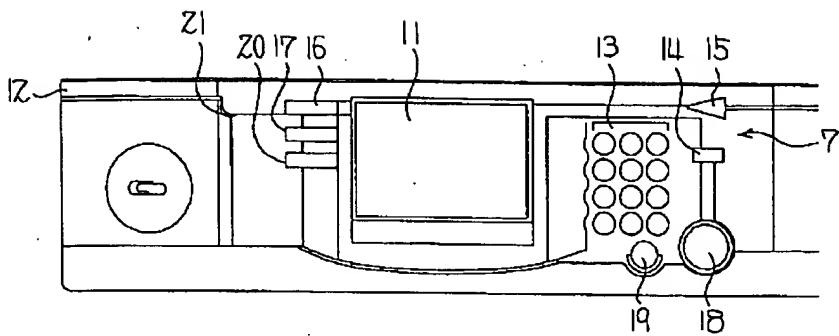
[Drawing 2]



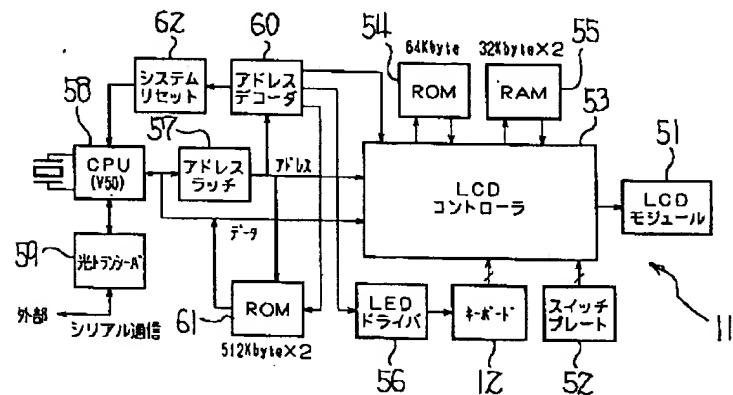
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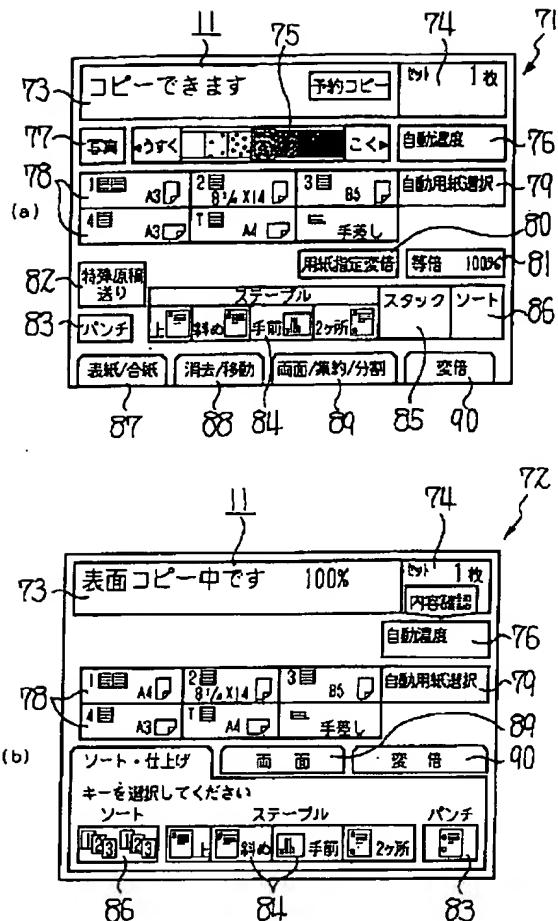
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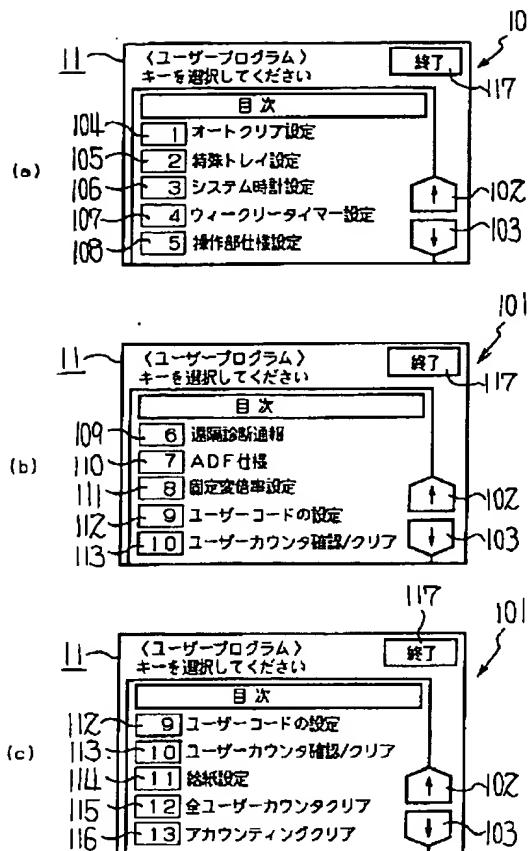
[Drawing 5]



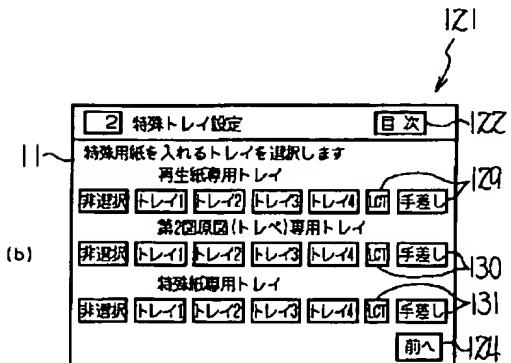
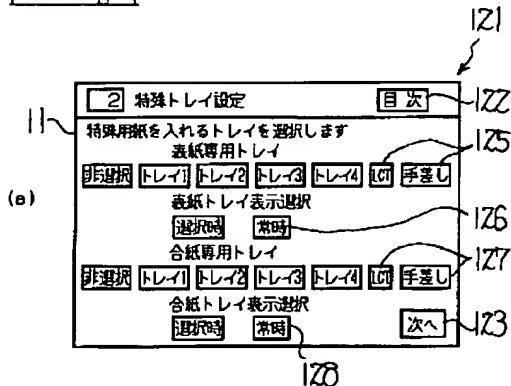
[Drawing 6]



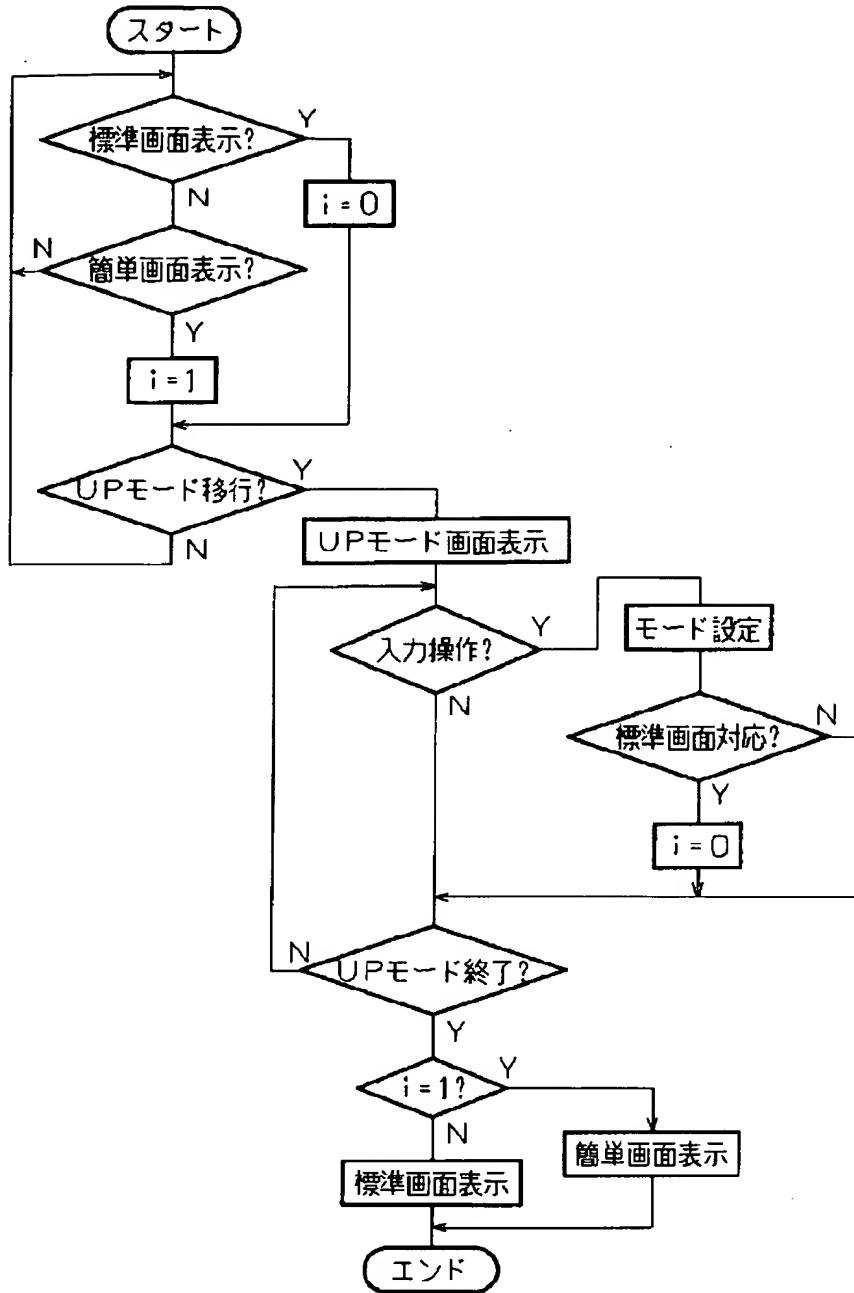
[Drawing 7]



[Drawing 8]



### [Drawing 9]



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**CLAIMS**

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[Claim(s)]

[Claim 1] An image formation means to form an image in a print sheet according to the set-up various information, The touch panel which displays various screens and receives the alter operation of various information, A usual display means to display the standard screen corresponding to actuation of the various functions of said image formation means, and the easy screen corresponding to actuation of a part of functions free [ a change-over on said touch panel ] at the time of standby of image formation, A setting display means to make said touch panel display temporarily the setting screen corresponding to the mode setting of the various functions of said image formation means while displaying a standard screen or an easy screen, A condition detection means to detect that the contents of a setting by which alter operation was carried out to the setting screen relate to the correspondence function of a standard screen without relation to the correspondence function of an easy screen, Image formation equipment characterized by having a display-control means to display a standard screen on said touch panel compulsorily regardless of the screen before displaying after completion of a temporary display of a setting screen if it is detected that the contents of a setting instrument setup relate to a standard screen without relation to an easy screen.

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